

DO NOT ENTER

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in this application.

1 (currently amended) An optical sensor for monitoring molecular binding interactions said sensor comprising:

A) at least one porous silicon region comprising more than 1,000 pores, each pore having a nominal width and a nominal depth at least 10 times larger than said nominal width with the depth of each pore being approximately equal to the depth of at least most of the other pores in said porous silicon region, said porous silicon region defining a top surface and a bottom surface, said bottom surface being parallel or approximately parallel to said top surface;

B) at least one buffer-sample fluid flow channel located above said at least one porous silicon region providing a fluid flow passage across said porous silicon region;

C) at least one light source for illuminating said at least one porous silicon region;

D) at least one spectral interference monitor adapted to monitor interference patterns for monitoring caused by interference of light reflected from said top surface and with light reflected from said bottom surface of said at least one porous silicon region;

E) a fluid flow control system for producing controlled flow of buffer solutions, ligand containing solution and analyte containing solutions through said at least one fluid flow channel; and

F) a computer processor programmed with a computer program for making molecular binding measurements based on changes in the spectral interference patterns monitored by the at least one spectral interference monitor while analytes bind with and disassociate from ligands attached to surfaces of said pores.

2 (previously presented) The optical sensor as in claim 1 wherein said at least one porous silicon region is a plurality of porous silicon regions, said at least one buffer-sample fluid flow channel is a plurality of fluid flow channels, said at least one light source is a plurality of light sources and said at least one spectral monitor is a plurality of spectral monitors.

3 (previously presented) The optical sensor as in claim 2 wherein said plurality of porous silicon regions is at least four porous silicon regions.

4 (previously presented) The optical sensor as in claim 1 wherein said molecular binding measurements are kinetic molecular binding measurements.